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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,154	02/06/2004	Harald Kaspar	58561US004	7304
32692	7590	07/09/2004	EXAMINER	
3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427			HU, HENRY S	
			ART UNIT	PAPER NUMBER

1713

DATE MAILED: 07/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/774,154

Applicant(s)

KASPAR ET AL.

Examiner

Henry S. Hu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 1 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

### DETAILED ACTION

1. It is noted that the examiner has accepted two drawing sheets with Fig. 1 and Fig. 2 filed with this application. **Claims 1-10 are pending** now.

It is also noted by the examiner that **USPTO has not received a certified copy of priority document EP 03075848.6**. The Applicants need to submit it in order to claim the priority date of 3-25-2003, otherwise only US filing date of 2-6-2004 will be granted. An action follows.

### *Specification*

2. The disclosure is objected to because of the following informalities:

(a) On **page 18** at line 8, recitation of “vinylidene fluoride” is wrong and should be changed to “**vinylidene fluoride**” according to traditional wording. Please refer to page 1 at line 23 for a correct wording.

(b) On **page 18** at line 11, recitation of “KMnO<sub>4</sub>-solution” is better to change to “**KMnO<sub>4</sub> solution**” according to traditional wording.

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(c) On **page 22** at line 10, recitation of “ammoniumperoxodisulfate” is wrong and should be changed to “**ammonium peroxodisulfate**”.

Appropriate corrections for (a) - (c) are required.

### ***Claim Objections***

3. Claim 1 is objected to because of the following informalities:

On **Claim 1** at lines 10-11, phrase of “said fluoropolymer having long chain branches” is not consistent with the statement disclosed on page 26 at line 13. Regrouping on Claim 1 is needed. Otherwise, this limitation may be in optional use and thereby may have no weight.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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**Claims 9 and 10** provide for the use of a fluoropolymer as defined in Claim 1, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

**Claims 9 and 10 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).**

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

*The limitation of parent **Claim 1** of the present invention relates to **a fluoropolymer that is melt-processible and thermoplastic and that has a melting point between 100 °C and 320 °C, said fluoropolymer being derived from (a) one or more gaseous fluorinated monomers; (b) one or more modifiers selected from (i) olefins having a bromine or iodine atom bonded to a carbon***

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of the double bond of the olefin, (ii) **olefins having a formula (I) of  $X^a_2C=CX^a-R_f-Br$**  wherein  $X^a$  is H, F, Br, Cl, or I;  $R_f$  is perfluoroalkylene, perfluorooxyalkylene or perfluoropolyether group and (iii) mixtures thereof; and (c) **optionally** one or more comonomers selected from non-gaseous fluorinated monomers and non-fluorinated monomers, said fluoropolymer having long chain branches. Other parent **Claim 7** relates to the process of making fluoropolymers of **Claim 1**. See other limitations of dependent **Claims 2-6 and 8-10**.

6. Claims 1-2, 6-7 and 9-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Bekiarian et al. (US 4,612,357) or Bekiarian et al. (EP 0,208,305 A2), each individually.

Regarding the limitation of parent **Claim 1**, **Bekiarian et al.** in both US and EP patents, disclose the preparation of **melt-processible, thermoplastic tetrafluoroethylene copolymers comprising units of tetrafluoroethylene, iodo(perfluoroalkyl) ethylene** and optionally a third comonomer such as  $R_f-CF=CF_2$  or  $R_f-O-CF=CF_2$  (column 1, line 50-64; abstract, line 1-4; title). **Bekiarian et al.** has further disclosed that the copolymers are melt-processible with melt viscosity can be measured at the processing temperature of 320-400 °C. It is noted such a statement reads on the limitation of melting point of 100-320 °C due to the fact in the art that processing temperature is always higher than melting point. Phrase of “said fluoropolymer having **long chain branches**” is found not consistent with the statement on page 26 at line 13, this claim limitation may be optional and thereby the examiner treats it with no merit.

7. Regarding **Claim 2**, tetrafluoroethylene is specifically used as major monomer.

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Regarding **Claim 6**, a third comonomer such as  $R_1\text{-CF=CF}_2$  or  $R_1\text{-O-CF=CF}_2$  (column 1, line 50-64; abstract, line 1-4; title) is included, thereby it includes hexafluoropropylene or a perfluorinated vinyl ether.

Regarding **Claim 7**, the modifier monomers are used in an amount of **not more than 0.03 wt %** of total weight (column 1, line 54-58; see examples 1-2 on columns 6-7).

Regarding **Claims 9 and 10**, the copolymers can be **extruded into shaped articles** such as **wire** (column 1, line 8-9 and 23-36).

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

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3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 3-5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bekiarian et al. (US 4,612,357) or Bekiarian et al. (EP 0,208,305 A2), each individually in view of Duvalsaint et al. (US 6,277,937 B1).

The discussion of the disclosures of the prior art of Bekiarian et al. (357) or Bekiarian et al. (305) for Claims 1-2 and 5-10 of this office action is incorporated here by reference.

Regarding **Claims 3 and 4**, both the Bekiarian references are silent about the preparation of such a fluorinated copolymer with an olefin having at least one bromine or iodine bonded directly to double bond. Duvalsaint et al. teach that in the course of making fluorinated copolymers, bromine or iodine-containing monomers such as bromotrifluoroethylene or vinyl bromide can be included. The advantage is such halogenated monomers can be useful as a cure site to provide crosslinking and such obtained copolymers have substantially no ionic end groups (column 5, line 1-49; column 1, line 16-44).

In light of the fact that Bekiarian et al. (357), Bekiarian et al. (305) and Duvalsaint all include halogenated comonomers to be useful as cure-site monomer in order to obtain curable fluoropolymers. Therefore, one having ordinary skill in the art would find it obvious to modify Bekiarian et al. (357) or Bekiarian et al. (305)'s copolymer preparation by **replacing iodo(perfluoroalkyl) ethylene with other bromine or iodine-containing monomers such as**



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**bromotrifluoroethylene or vinyl bromide** as taught by Duvalsaint. By doing so, one would expect to obtain the same curable function on fluoropolymers due to the existence of halogen atoms. Additionally, such obtained copolymers have substantially no ionic end groups. Thereby a better fluoropolymer can be obtained.

10. Regarding **Claims 5 and 8**, when Bekiarian's **iodo(perfluoroalkyl) ethylene** is replaced by other bromine or iodine-containing monomers such as bromotrifluoroethylene, such obtained copolymers are thereby **perfluorinated**.

### *Conclusion*

11. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. The following references relate to a melt-processible and thermoplastic fluoropolymer, which comprises units of fluorinated monomers and one or more modifiers from olefins having a bromine or iodine atom bonded to a carbon of the double bond of the olefin, or olefins having a formula (I) of  $X^a_2C=CX^a-R_1-Br$  :

**US Patent No. 4,564,662 to Albin** discloses the preparation of fluorocarbon elastomers with repeating units of tetrafluoroethylene with small amount of cure-site co-monomer such as  $CF_3-CH_2-O-CF=CF-Br$  (abstract, line 1-11). They are curable by peroxide (abstract, line 1). However, the fluorinated copolymers are only elastomers.

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**US Patent No. 4,694,045 to Moore** discloses the preparation of fluorocarbon elastomers with repeating units of tetrafluoroethylene, perfluoro(alkyl vinyl ether) with small amount of cure-site co-monomer such as  $\text{CH}_2=\text{CH}-(\text{CF}_2)_x-\text{I}$  (abstract, line 1-6; column 4, line 29). They are curable by peroxide (column 3, line 59). However, the fluorinated copolymers are only amorphous elastomers.

12. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Henry S. Hu whose telephone number is **(571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM – 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306 for all regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Henry S. Hu

July 8, 2004



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